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We have installed a Bruker CCD detector on the Large Volume Press facility at X17B1. This detector gives near real-time data collection, and hence is much faster than our existing image plate facility. It has been used to explore the rheology of several materials (San Carlos olivine, see Figure 2), MgO, and alumina, as well as look at phase transitions (FeS, see Parise, *et al.*, this volume), fayalite, lawsonite, and FeO.

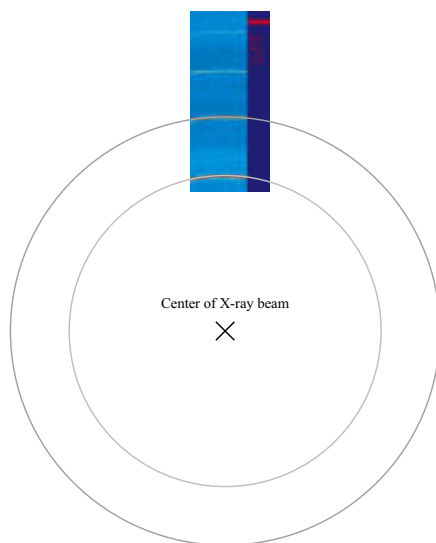


Figure 1. Geometry for diffraction data. The detector intercepts a small portion of the Debye rings at positive 2θ . The anvils of the high pressure device close horizontally to mask most of the area of the detector, leaving only a small strip exposed.

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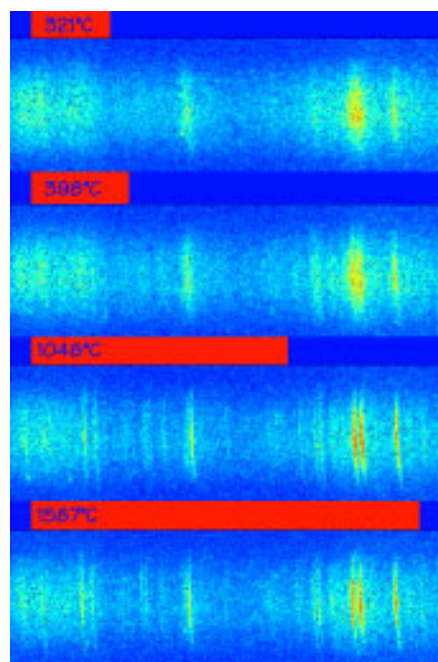


Figure 2. Series of "frames" from CCD detector, taken at several temperatures, showing the effect of stress relaxation in San Carlos olivine as temperature is increased. Pressure is about 10 GPa. Temperature is shown on bar graph at top of each frame.